

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

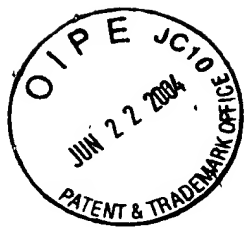
Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problem Mailbox.**



## Tomato Leaf DHS cDNA sequence

CGCAGAAACTCGCGGCGCAGTCTTGTTCCGTACATAATCTTGGTCTGCAATAATGGGAGAAGCTCTGAAGTACAGTATCATGGAC  
M G E A L K Y S I M D

TCAGTAAGATCGGTAGTTTTCAAAGAATCCGAAAATCTAGAAGGTTCTTGCACTAAAAATCGAGGGCTACGACTTCAATAAAGGCGT  
S V R S V V F K E S E N L E G S C T K I E G Y D F N K G V

TAACATGCTGAGCTGATCAAGTCCATGGTTCCACTGGTTCCAAAGCATCTAATCTTGGTGACGCCATTGCAATTGTTAATCAAA  
N Y A E L I K S M V S T G F Q A S N L G D A I A I V N Q

TGCTAGATTGGAGGCTTTCACATGAGCTGCCACGGAGGATTGCAGTGAAGAAGAAAGAGATGTTGCATACAGAGAGTCGGTAACC  
M L D W R L S H E L P T E D C S E E R D V A Y R E S V T

TGCAAAATCTTCTGGGGTTCACITCAAACCTTGTTCTTCTGGTGTAGAGACACTGTCCGCTACCTTGTTTCAGCACCGGATGGT  
C K I F L G F T S N L V S S G V R D T V R Y L V Q H R M V

TGATGTTGTGGTTACTACAGCTGGTGGTATTGAAGAGGATCTCATAAAGTGCCTCGCACCAACCTACAAGGGGACTTCTCTTTAC  
D V V V T T A G G I E E D L I K C L A P T Y K G D F S L

CTGGAGCTTCTACGATCGAAAGGATTGAACCGTATTGGTAACCTTATGGTTCCTAATGACAACACTACTGCAAAATTTGAGAATTGG  
P G A S L R S K G L N R I G N L L V P N D N Y C K F E N W

ATCATCCCAGTTTTTGACCAAATGTATGAGGAGCAGATTAAATGAGAAGGTTCTATGGACACCACCTCTAAAGTCATTGCTCGTCTGGG  
I I P V F D Q M Y E E Q I N E K V L W T P S K V I A R L G

FIG.1A

TAAAGAAATTAATGATGAACCTCATACTTGATTGGGCTTACAAGAACCGGATTCCCTGCTCTTCCTGCTGGCTTGACGGATGGAT  
K E I N D E T S Y L Y W A Y K N R I P V F C P G L T D G

CACTTGGTGACATGCTATACCTCCATTCTTTCAAAAAGGGTGATCCAGATAATCCAGATCTTAATCCTGGTCTAGTCATAGACATT  
S L G D M L Y F H S F K K G D P D N P D L N P G L V I D I

GTAGGAGATATTAGGGCCATGAATGGTGAAGCTGTCCATGCTGGTTTGAGGAAAGACAGGAATGATTATACCTGGGTGGAGGGCTGCC  
V G D I R A M N G E A V H A G L R K T G M I I L G G G L P

TAAGCACCATGTTTGCAATGCAATATGATGCGCAATGGTGCAGATTTGCCGTCTTCATTAAACCGCACAGAGTTTGATGGTA  
K H H V C N A N M M R N G A D F A V F I N T A Q E F D G

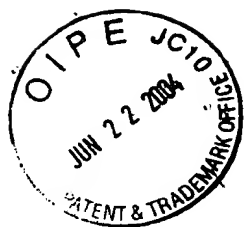
GTGACTCTGGTCCGCTCTGATGAAGCTGTATCATGGGGAAGATACGTGGTGGTGCCAAAGACTGTGAAGGTGCATTGTGATGCA  
S D S G A R P D E A V S W G K I R G G A K T V K V H C D A

ACCATTGCATTTCCCATATTAGTAGCTGAGACATTTGCAGCTAAGAGTAAGGAATTCCTCCAGATAAGGTGCCAAGTTTGAACATT  
T I A F P I L V A E T F A A K S K E F S Q I R C Q V

GAGGAAGCTGTCTCCGACCACACATATGAATTGCTAGCTTTTGAAGCCAACCTTGCTAGTGTGCAGCACCATTTATTCTGCAAAA  
CTGACTAGAGAGCAGGTATATCTCTACCCGAGTTAGACGACATCCTGTATGGTTCAAAATTAATTTTCTCCCTTCACA  
CCATGTTATTTAGTCTCTCTCGAAAGTGAAGAGCTTAGATGTTTCATAGGTTTGAATTATGTTGGAGGTTGGTGATAACT  
GACTAGTCTCTTACCATATAGATAATGTATCCTTGTAATGAGATTTTGGGTGTGTTTGATACCAAGGAAAAATGTTTATTGG  
AAAAAATTGGATTTTAAATTTTCTTGTTT

FIG.1B

3/42



MEDDRVFSVHSTVFKESSELEKCDKIEGYDFNQGVDPKLMRSMLTGFOASNLGEAIDVVNQMFEEFVLKLDWRLADETTV  
AEDCSEEEKNPSFRESVKCKIFLGFTSNLVSSGVRDTIRYLVQHMMVDVITTTGGVEEDLIKCLAPTFKGDFSLPGAYLRSK  
GLNRIGNLLVPNDNYCKFEDWIPIFDEMLKEQKEENWLTPSKLLARLKEINNNESSYLWAYKMNIPVFCPGLTDGSLGDM  
LYFHSFRTSGLIIDVWQDIRAMNGEAVHANPKKTGMIIILGGGLPKHHICNANMMRNGADYAVFINTGQEFDGSDSGARPDEAV  
SWGIRGSAKTVKVCFLISSHPNLYLTQWF

FIG.2B

GGTGGTTGAGGAAGATCTATAAATGCCTTGCACCTACATTTAAAGGTGATTTCTCTCTACCTGGAGCTTATTTAAG  
GTCAAAGGGATTGAACCGAATTGGGAATTTGCTGGTTCTTAATGATAACTACTGCAAGTTTGAGGATTGGATCATTCCCA  
TCTTTGACGAGATGTTGAAGGAACAGAAAGAGAATGTGTTGTGGACTCCTTCTAAACTGTTAGCACGGCTGGGAAAA  
GAAATCAACAATGAGAGTTCATACCTTTATTGGGCATACAAGATGAATATCCAGTATTCTGCCCAGGGTTAACAGATGG  
CTCTCTTAGGGATATGCTGTATTTCACTCTTTTCGTACCTCTGGCCTCATCATCGATGTAGTACAAGATATCAGAGCTA  
TGAACGGCGAAGCTGTCCATGCAATCCTAAAAGACAGGGATGATAATCCTTGGAGGGGGCTTGCCAAAGCACACATA  
TGTAATGCCAATATGATGCGCAATGGTGCAGATTACGCTGTATTTATAACACACCGGGCAAGAAATTTGATGGGAGCGACTC  
GGGTGCACGCCCTGATGAAGC

FIG.2C

GGVEEDLIKCLAPTFKGDFSLPGAYLRSKGLNRIGNLLVPNDNYCKFEDWIPIFDEMLKEQKEENWLTPSKLLARLKEIN  
NESSYLWAYKMNIPVFCPGLTDGSLRDMLYFHSFRTSGLIIDVWQDIRAMNGEAVHANPKKTGMIIILGGGLPKHHICNANMM  
RNGADYAVFINTGQEFDGSDSGARPDE

FIG.2D

Multiple DHS Sequence Alignments of Human, Arabidopsis, Tomato, Yeast, Neurospora (Fungi), and Methanococcus (Archaeobacteria)

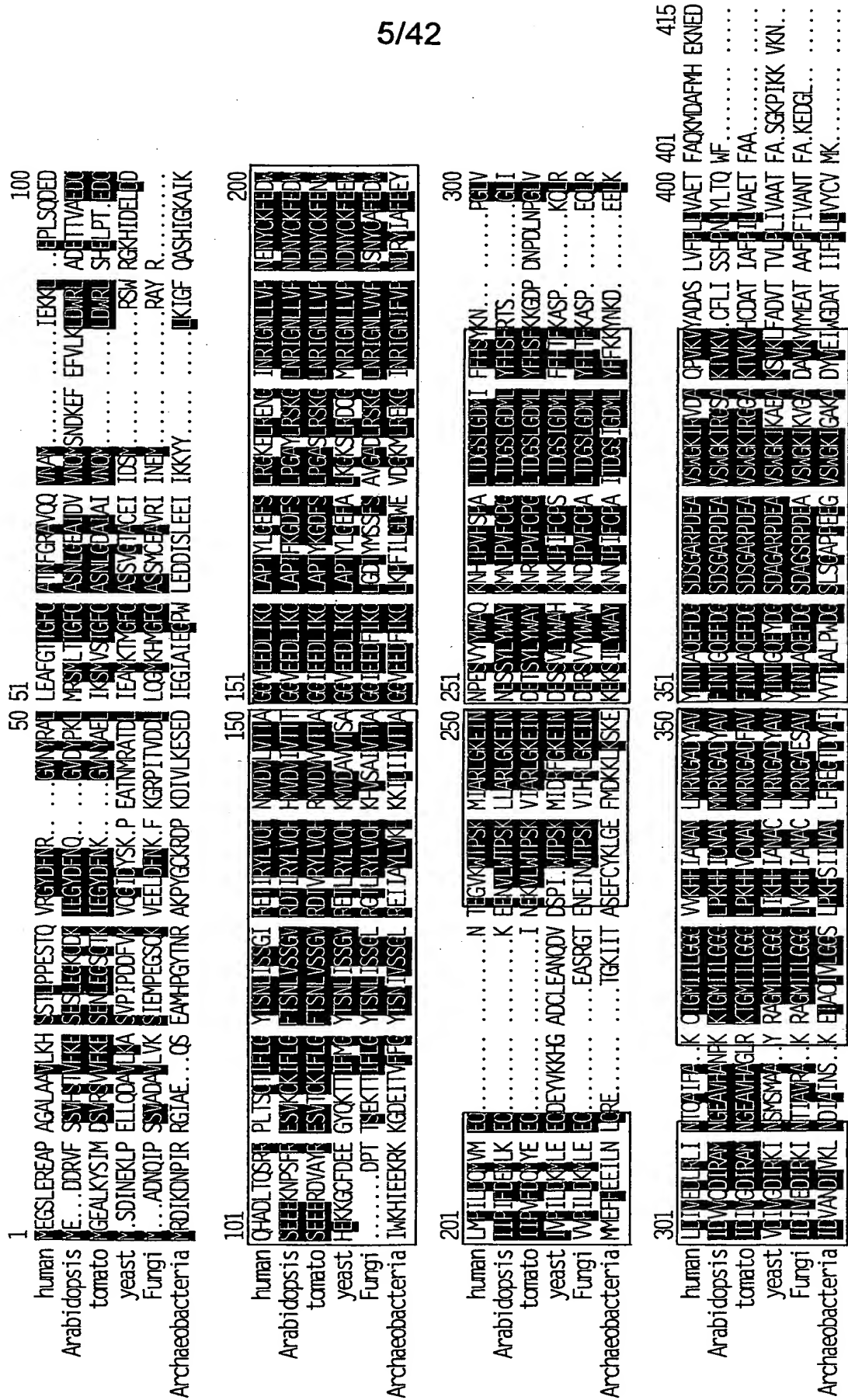


FIG. 3

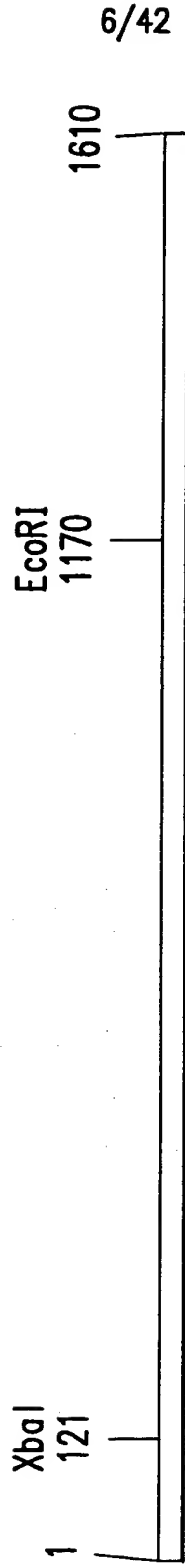
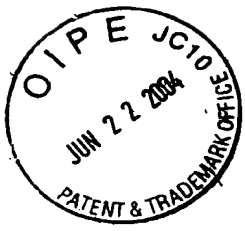


FIG.4



7/42

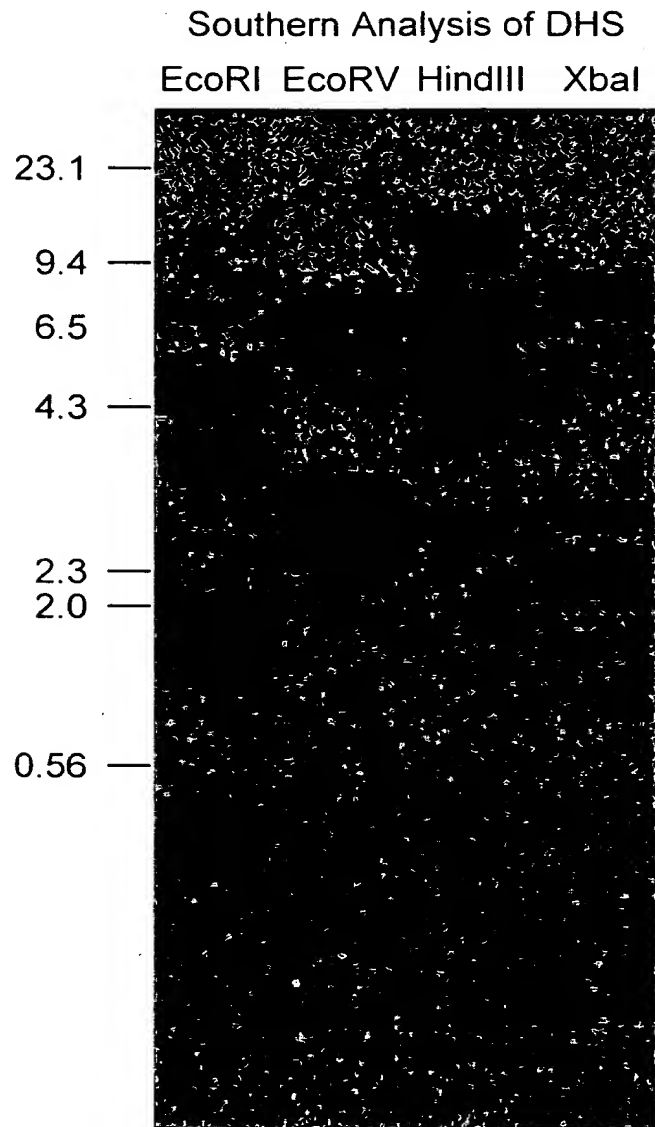
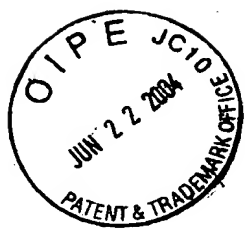


FIG.5





8/42

Northern analysis of DHS on  
tomato flowers

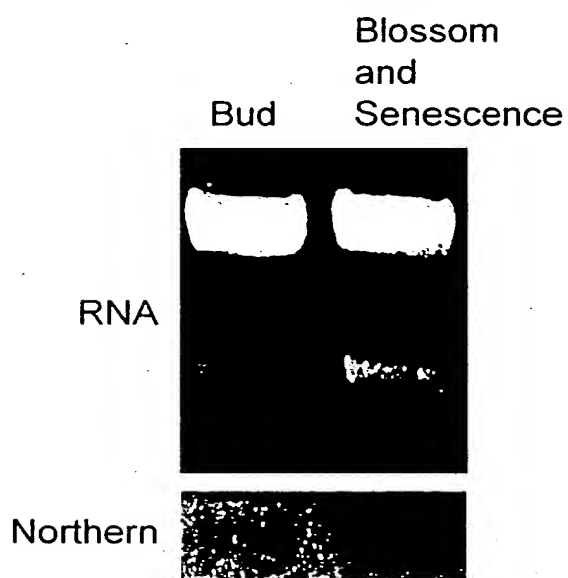


FIG.6



9/42

NORTHERN ANALYSIS OF DHS  
ON DEVELOPMENTAL STAGES OF  
TOMATO FRUIT

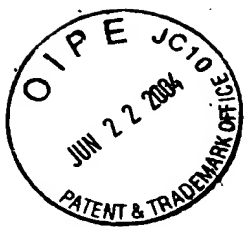
BREAKER PINK

RIPE  
(RED)

NORTHERN  
BLOT



FIG.7



10/42

Northern Analysis of DHS – 2M  
Sorbitol treated Tomato Leaves

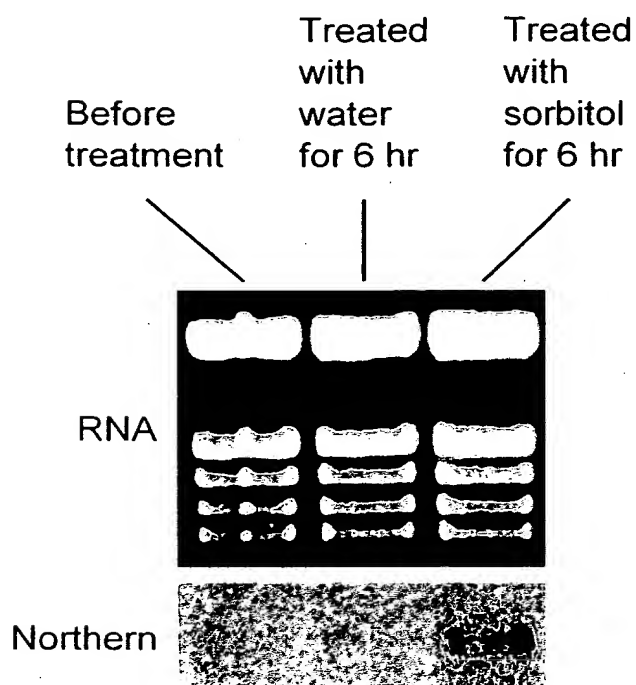
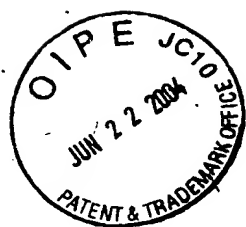


FIG.8



11/42

# NORTHERN ANALYSIS OF DHS TOMATO LEAF CHILLING EFFECTS

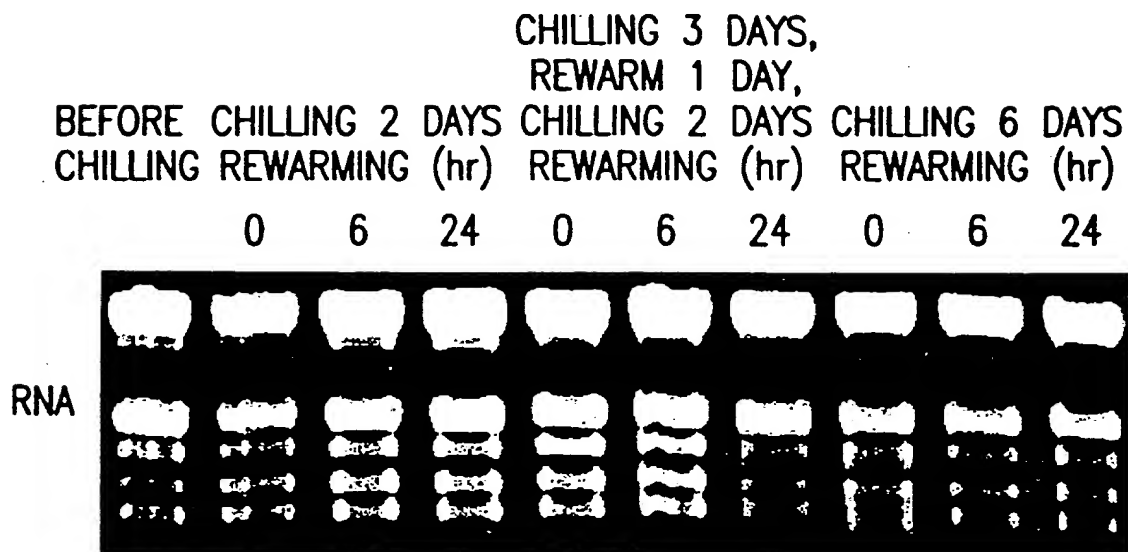


FIG.9A

Northern



FIG.9B

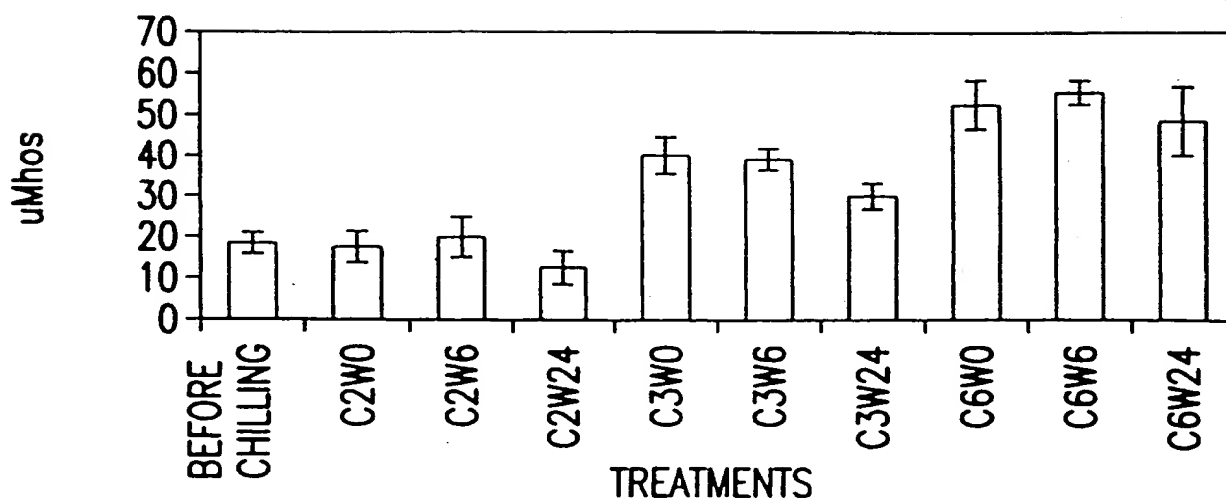


FIG.9C



12/42

Canation DHS cDNA Sequence

GTCATTACAATGCATAGGATCATTGCACATGCTACCTTCCTCATTGCACTTGAGCTTGCCATA  
CTTTTGTGTTTGGACGTTTGATAATAATACTATGAAAAATATTATGTTTTTCTTTTGTGTGTTG  
GTGTTTTTGAAGTTGTTTTGATAAGCAGAACCCAGTTGTTTTACACTTTTACCATTGAACATA  
CTGCAATTCTAAAACCTTTGTTTACATTTTAATTCCATCAAAGATTGAGTTCAGCATAGGAAAA  
AGGATGGAGGATGCTAATCATGATAGTGTGGCATCTGCGCACTCTGCAGCATTCAAAAAGTCG  
M E D A N H D S V A S A H S A A F K K S  
GAGAATTTAGAGGGGAAAAGCGTTAAGATTGAGGGTTATGATTTTAATCAAGGTGTAACTAT  
E N L E G K S V K I E G Y D F N Q G V N Y  
TCCAAACTCTTGAATCTTTGCTTCTAATGGGTTTCAAGCCTCGAATCTTGAGATGCCATT  
S K L L Q S F A S N G F Q A S N L G D A I  
GAAGTAGTTAATCATATGCTAGATTGGAGTCTGGCAGATGAGGCACCTGTGGACGATTGTAGC  
E V V N H M L D W S L A D E A P V D D C S  
GAGGAAGAGAGGGATCCTAAATTCAGAGAATCTGTGAAGTGCAAAGTGTCTTGGGCTTTACT  
E E E R D P K F R E S V K C K V F L G F T  
TCAAATCTTATTTCTCTGGTGTTCGTGACACAATTCGGTATCTCGTGCAACATCATATGGTT  
S N L I S S G V R D T I R Y L V Q H H M V  
GACGTGATAGTAACGACAACCGGAGGTATAGAAGAAGATCTAATAAAAGGAAGATCCATCAAG  
D V I V T T T G G I E E D L I K G R S I K  
TGCCTTGCACCCACTTTCAAAGGCGATTTTGCCTTACCAGGAGCTCAATTACGCTCCAAAGGG  
C L A P T F K G D F A L P G A Q L R S K G  
TTGAATCGAATTGGTAATCTGTTGGTTCCGAATGATAACTACTGTAAATTTGAGGATTGGATC  
L N R I G N L L V P N D N Y C K F E D W I  
ATTCCAATTTTAGATAAGATGTTTGAAGAGCAAATTTTCAAGAGAAAATCTTATGGACACCATCG  
I P I L D K M L E E Q I S E K I L W T P S  
AAGTTGATTGGTCGATTAGGAAGAGAAATAAACGATGAGAGTTCATACCTTTACTGGGCCTTC  
K L I G R L G R E I N D E S S Y L Y W A F  
AAGAACAATATTCCAGTATTTTGGCCAGGTTTAAACAGACGGCTCACTCGGAGACATGCTATAT  
K N N I P V F C P G L T D G S L G D M L Y  
TTTCATTCTTTTTCGAATCCGGGTTTAAATCGTCGATGTTGTGCAAGATATAAGAGCAGTAAAT  
F H S F R N P G L I V D V V Q D I R A V N  
GGCGAGGCTGTGCACGCAGCGCCTAGGAAAACAGGCATGATTATACTCGGTGGAGGGTTGCCT  
G E A V H A A P R K T G M I I L G G G L P  
AAGCACCACATCTGCAACGCAAACATGATGAGAAATGGCGCCGATTATGCTGTTTTTCATCAAC  
K H H I C N A N M M R N G A D Y A V F I N  
ACTGCCGAAGAGTTTGACGGCAGTGATTCTGGTGCTCGCCCCGATGAGGCTATTTTCATGGGGC  
T A E E F D G S D S G A R P D E A I S W G  
AAAATTAGCGGATCTGCTAAGACTGTGAAGGTGCATTGTGATGCCACGATAGCTTTCCCTCTA  
K I S G S A K T V K V H C D A T I A F P L  
CTAGTCGCTGAGACATTTGACGCAAAAAAGAGAAAAAGAGAGGAAGAGCTGTAAAACTTTTTT  
L V A E T F A A K R E K E R K S C  
GATTGTTGAAAAATCTGTGTTATACAAGTCTCGAAATGCATTTTAGTAATTGACTTGATCTTA  
TCATTTCAATGTGTTATCTTTGAAAAATGTTGGTAATGAAACATCTCACCTCTTCTATACAACA  
TTGTTGATCCATTGTACTCCGTATCTTGTAAATTTTGGAAAAAAAACCGTCTATTGTTACGA  
GAGAGTACATTTTGTAGGTAAAAATATAGGATTTTGTGCGATGCAAATGCTGGTTATTCCT  
TGAAAAAAAACCAAAAAA

(1384 bps, not include Poly A tail and 5'end nocoding region.  
373 Amino Acid.)

FIG.10



13/42

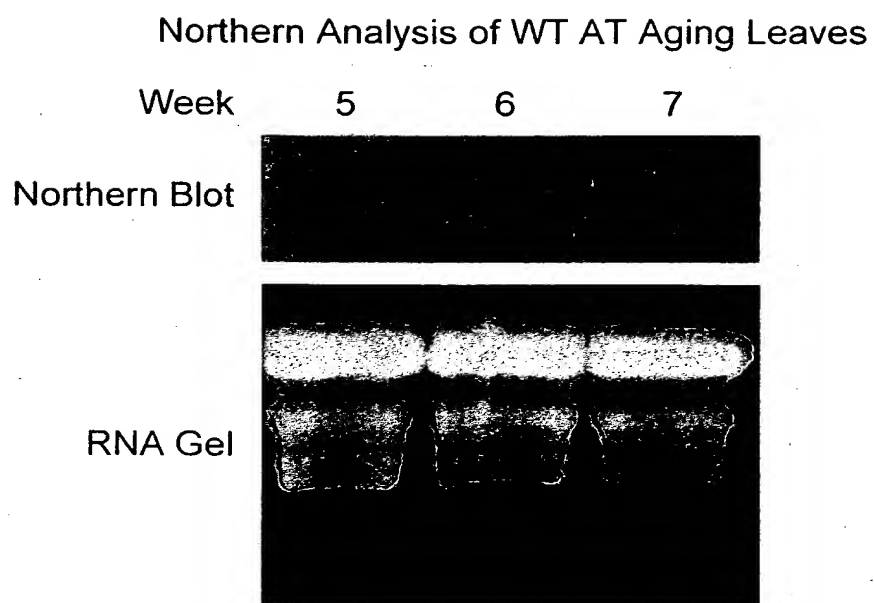


FIG.11



14/42

Northern Analysis of Canation Petal (*In Situ*) DHS

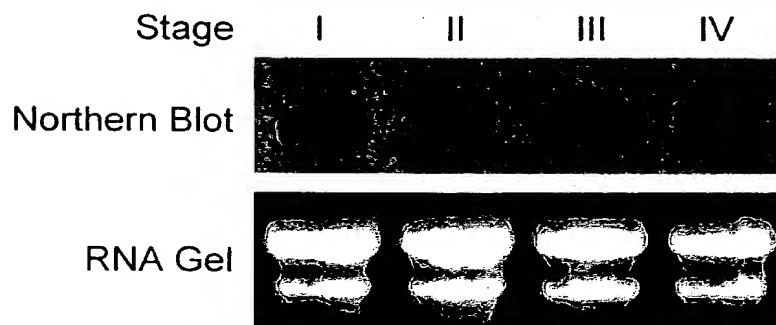
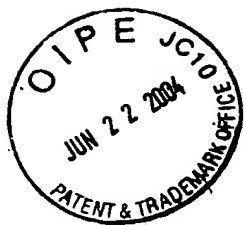


FIG.12



15/42

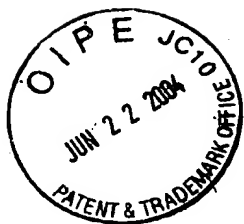
Tomato eif5A

AAAGAATCCTAGAGAGAGAAAGGGAATCCTAGAGAGAGAAGCATGTCGGACGAAGAACAC  
M S D E E H  
CATTTTGAGTCAAAGGCAGATGCTGGTGCCTCAAAAACCTTCCCACAGCAAGCTGGAACC  
H F E S K A D A G A S K T F P Q Q A G T  
ATCCGTAAGAATGGTTACATCGTTATCAAAGGCCGTCCCTGCAAGGTTGTTGAGGTCTCC  
I R K N G Y I V I K G R P C K V V E V S  
ACTTCAAAAACCTGGAAAACACGGACATGCTAAATGTCACTTTGTGGCAATTGACATTTTC  
T S K T G K H G H A K C H F V A I D I F  
AATGGAAAGAACTGGAAGATATCGTTCCGTCCTCCCACAATTGTGATGTGCCACATGTT  
N G K K L E D I V P S S H N C D V P H V  
AACCGTACCGACTATCAGCTGATTGATATCTCTGAAGATGGTTTTGTCTCACTTCTTACT  
N R T D Y Q L I D I S E D G F V S L L T  
GAAAGTGGAAACACCAAGGATGACCTCAGGCTTCCCACCGATGAAAATCTGCTGAAGCAG  
E S G N T K D D L R L P T D E N L L K Q  
GTTAAAGATGGGTTCCAGGAAGGAAAGGATCTTGTGGTGTCTGTTATGTCTGCGATGGGC  
V K D G F Q E G K D L V V S V M S A M G  
GAAGAGCAGATTAACGCCGTTAAGGATGTTGGTACCAAGAATTAGTTATGTCATGGCAGC  
E E Q I N A V K D V G T K N  
ATAATCACTGCCAAAGCTTTAAGACATTATCATATCCTAATGTGGTACTTTGATATCACT  
AGATTATAAACTGTGTTATTTGCACTGTTCAAAACAAAAGAAAAGAAAAGCTGCTGTTATGG  
CTAGAGAAAAGTATTGGCTTTGAGCTTTTGACAGCACAGTTGAACTATGTGAAAATTCTAC  
TTTTTTTTTTTTGGGTAAAATACTGCTCGTTTAATGTTTTGCAAAAAAAAAAAAAAAAAA

764 bps, not: including Poly(A) tail; 160 amino acids

**FIG.13**





16/42

Carnation-F5A

CTCTTTTACATCAATCGAAAAAAATTAGGGTTCTTATTTTAGAGTGAGA  
GGCGAAAAATCGAACGATGTCGGACGACGATCACCATTTCGAGTCATCGG  
M S D D D H H F E S S A  
CCGACGCCGGAGCATCCAAGACTTACCCTCAACAAGCTGGTACAATCCGC  
D A G A S K T Y P Q Q A G T I R  
AAGAGCGGTCACATCGTCATCAAAAATCGcCCTTGCAAGGtGGTTGAGGT  
K S G H I V I K N R P C K V V E V  
TTCTACCTCCAAGACTGGCAAGCACGGTCATGCCAAATGTCACTTTGTTG  
S T S K T G K H G H A K C H F V A  
CCATTGACATTTTCAACGGCAAGAAGCTGGAAGATATTGTCCCCTCATCC  
I D I F N G K K L E D I V P S S  
CACAATTGTGATGTTCCACATGTCAACCGTGTGACTACCAGCTGCTTGA  
H N C D V P H V N R V D Y Q L L D  
TATCACTGAAGATGGCTTTCTTAGTCTGCTGACTGACAGTGGTGACACCA  
I T E D G F V S L L T D S G D T K  
AGGATGATCTGAAGCTTCCTGCTGATGAGGCCCTTGTGAAGCAGATGAAG  
D D L K L P A D E A L V K Q M K  
GAGGGATTTGAGGCGGGGAAAGACTTGATTCTGTCAGTCATGTGTGCAAT  
E G F E A G K D L I L S V M C A M  
GGGAGAAGAGCAGATCTGCGCCGTCAAGGACGTTAGTGGTGGCAAGTAGA  
G E E Q I C A V K D V S G G K  
AGCTTTTGTGATGAATCCAATACTACGCGGTGCAGTTGAAGCAATAGTAATC  
TCGAGAACATTCTGAACCTTATATGTTGAATTGATGGTGCTTAGTTTGT  
TTGGAAATCTCTTTGCAATTAAGTTGTACCAAATCAATGGATGTAATGTC  
TTGAATTTGTTTTATTTTTGTTTTGATGTTTGCTGtGATTGCATTATGCA  
TTGTTATGAGTTATGACCTGTTATAACACAAGGTTTTGGTAAAAAAAAA  
AAAAAAAAAAAA

790 bps, 160 amino acids

FIG.14



17/42

Arabidopsis F5A

CTGTTACCAAAAAATCTGTACCGCAAAATCCTCGTCGAAGCTCGCTGCTGCAACCATGTC  
M S  
CGACGAGGAGCATCACTTTGAGTCCAGTGACGCCGGAGCGTCCAAAACCTACCTCAACA  
D E E H H F E S S D A G A S K T Y P Q Q  
AGCTGGAACCATCCGTAAGAATGGTTACATCGTCATCAAAAATCGTCCCTGCAAGGTTGT  
A G T I R K N G Y I V I K N R P C K V V  
TGAGGTTTCAACCTCGAAGACTGGCAAGCATGGTCATGCTAAATGTCATTTTGTAGCTAT  
E V S T S K T G K H G H A K C H F V A I  
TGATATCTTCACCAGCAAGAACTCGAAGATATTGTTCTTCTTCCACAATTGTGATGT  
D I F T S K K L E D I V P S S H N C D V  
TCCTCATGTCAACCGTACTGATTATCAGCTGATTGACATTTCTGAAGATGGATATGTCAG  
P H V N R T D Y Q L I D I S E D G Y V S  
TTTGTGACTGATAACGGTAGTACCAAGGATGACCTTAAGCTCCCTAATGATGACACTCT  
L L T D N G S T K D D L K L P N D D T L  
GCTCCAACAGATCAAGAGTGGGTTTGATGATGGAAAAGATCTAGTGGTGAGTGTAAATGTC  
L Q Q I K S G F D D G K D L V V S V M S  
AGCTATGGGAGAGGAACAGATCAATGCTCTTAAGGACATCGGTCCCAAGTGAGACTAACA  
A M G E E Q I N A L K D I G P K  
AAGCCTCCCCTTTGTTATGAGATTCTTCTTCTTCTGTAGGCTTCCATTACTCGTCGGAGA  
TTATCTTGTTTTTGGGTTACTCCTATTTTGGATATTTAACTTTTGTTAATAATGCCATC  
TTCTTCAACCTTTTCCTTCTAGATGGTTTTTATACTTCTTCT

754 bps, not including Poly(A) tail; 158 amino acids

FIG.15

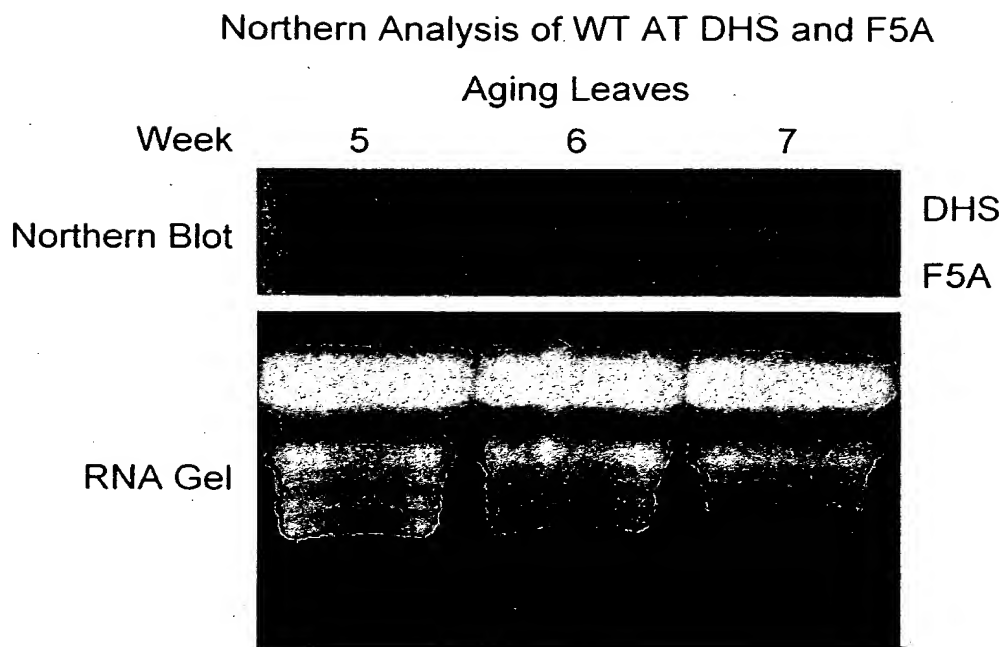


FIG.16



19/42

Northern Analysis of Ripening Tomato Fruit

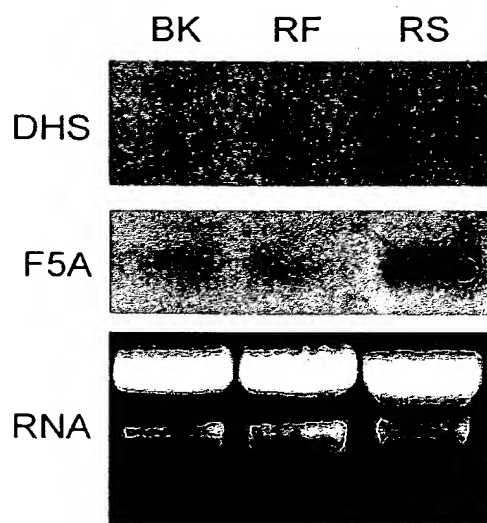
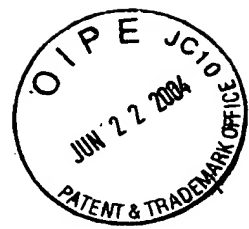


FIG.17



20/42

Northern Analysis of sorbitol-treated tomato leaves

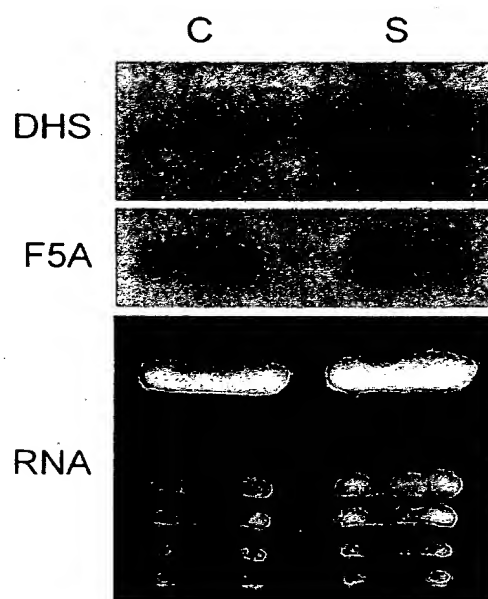


FIG.18

Northern Analysis of Tomato Flowers

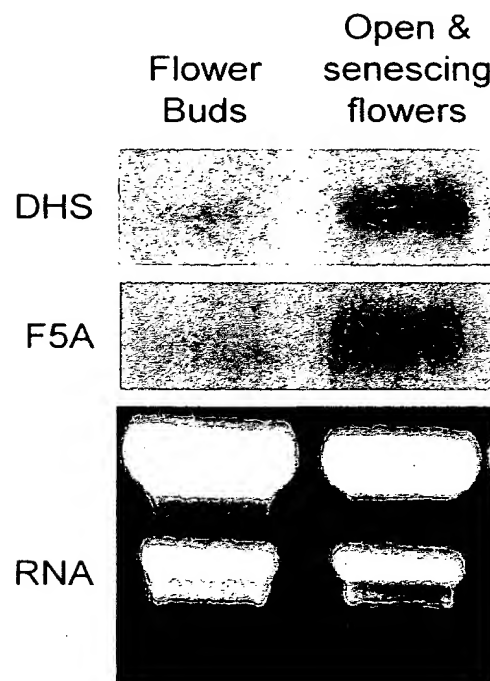


FIG.19

Northern Analysis of chill-injured tomato leaves

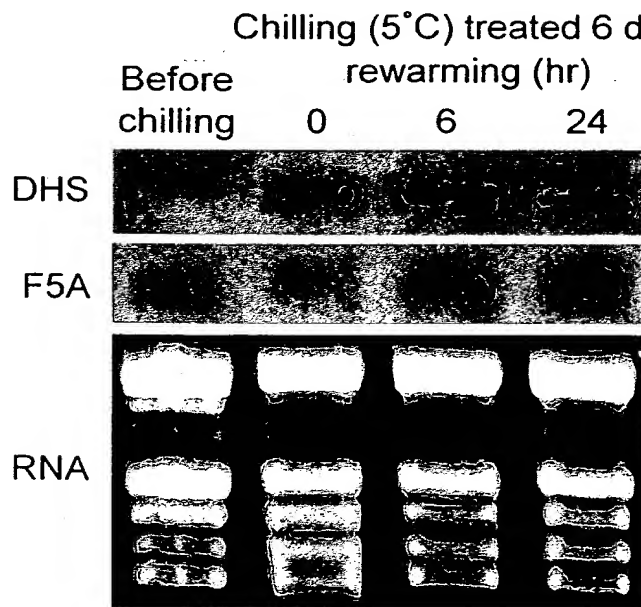
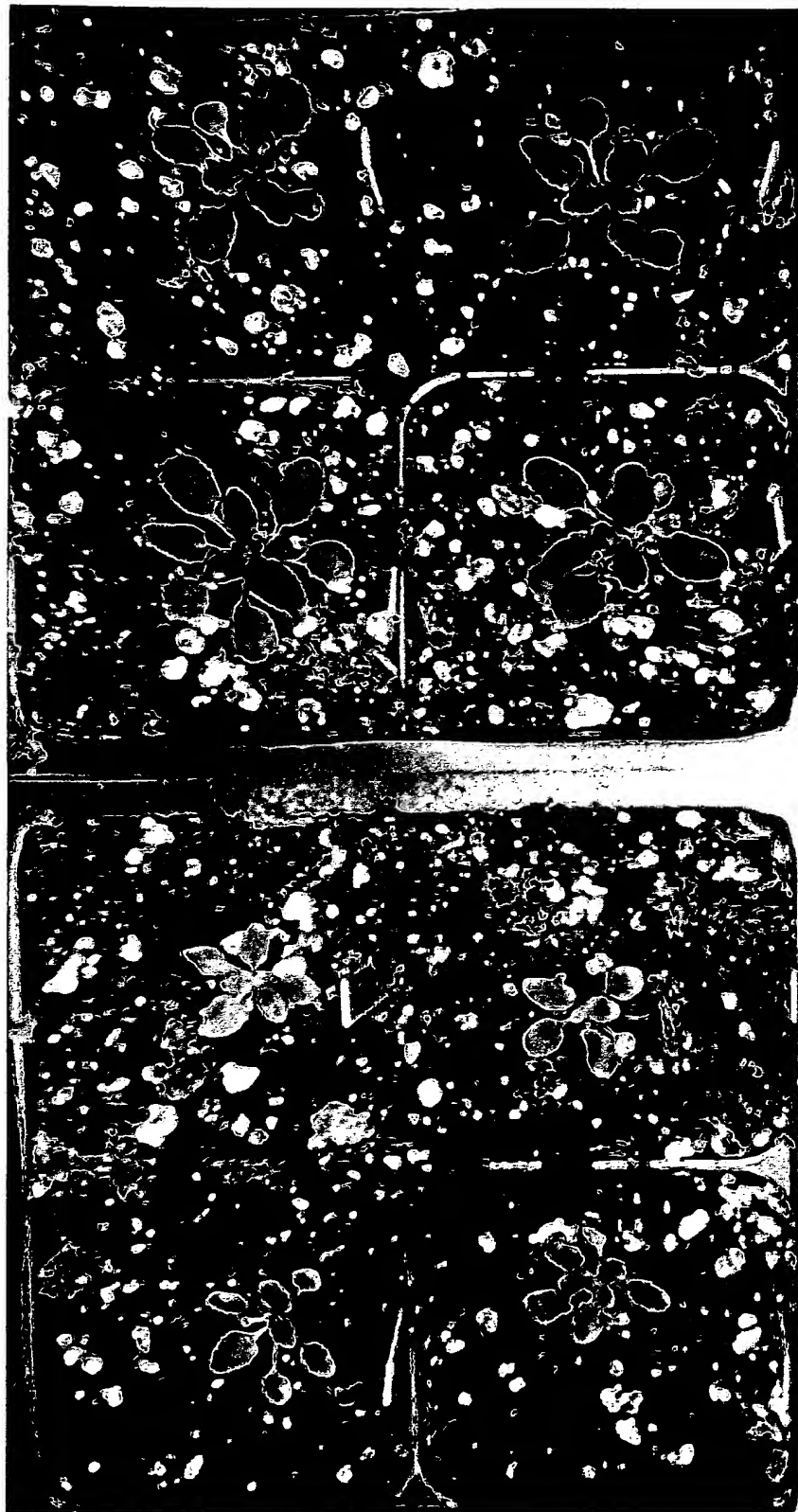


FIG.20

23/42

3.1 Weeks



Wild-Type

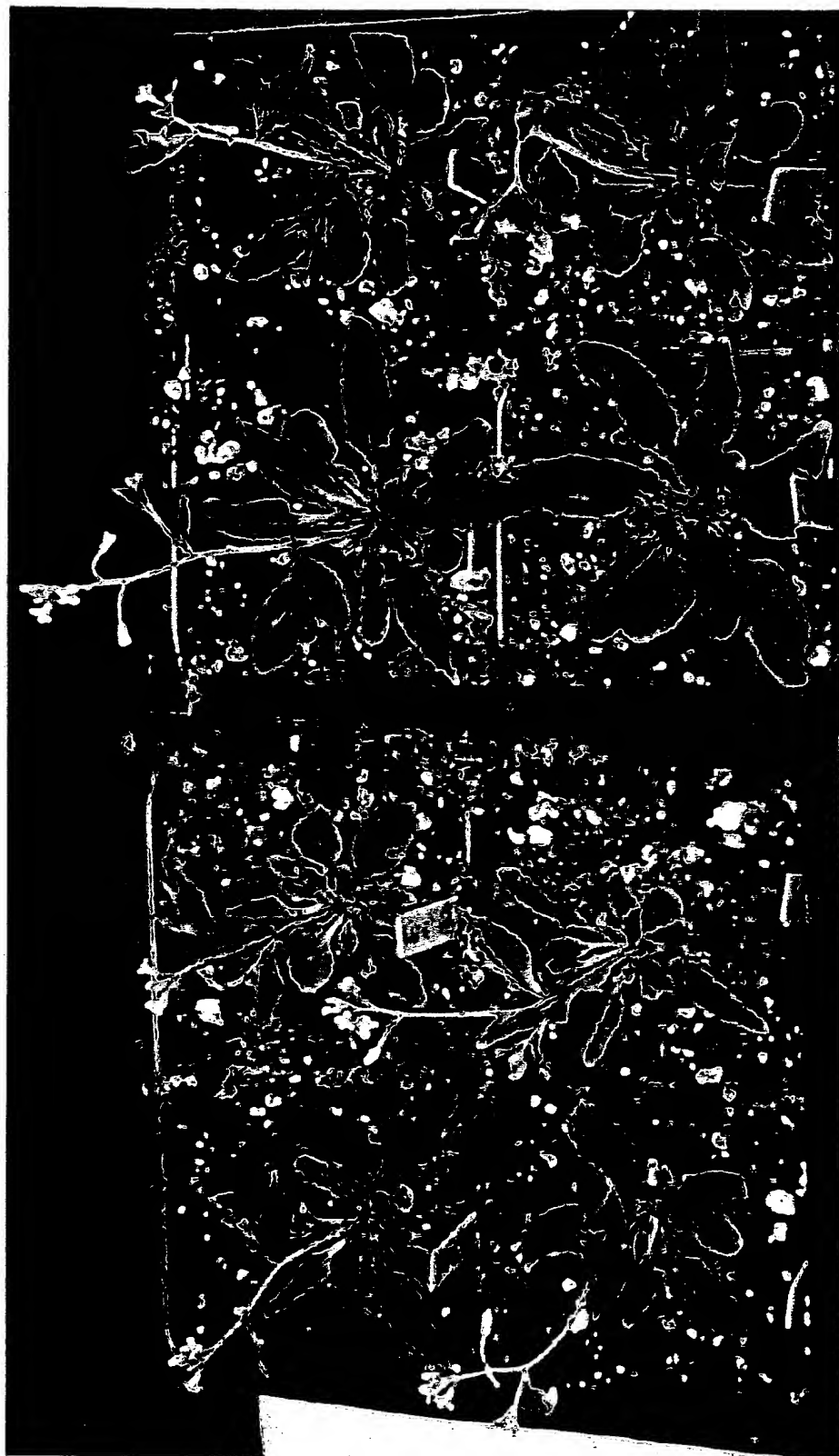
$\alpha$ -3'DHS # 3

FIG. 21



24/42

4.6 Weeks

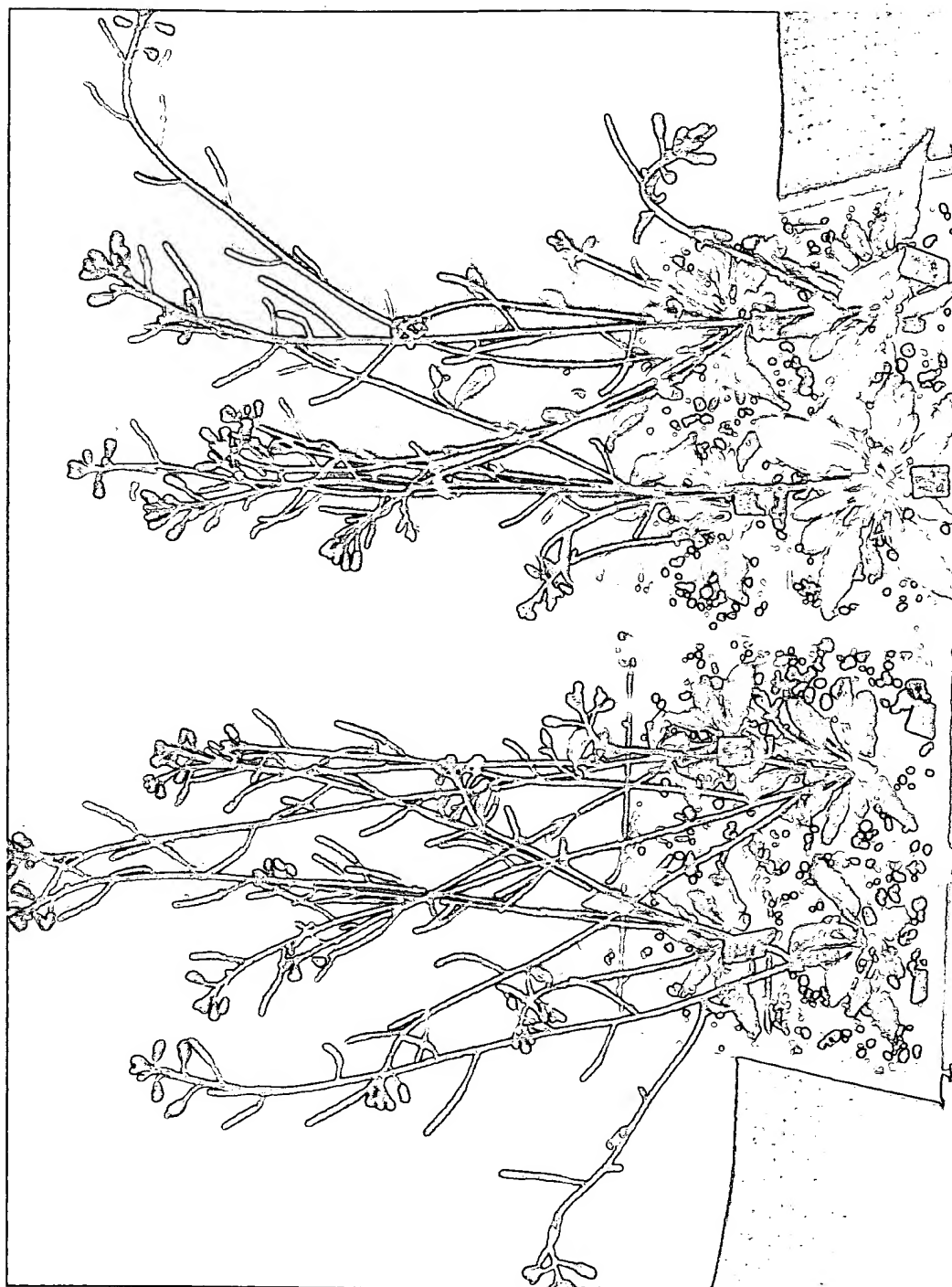


Wild-Type

$\alpha$ -3'DHS #3

FIG. 22

5.6 Weeks

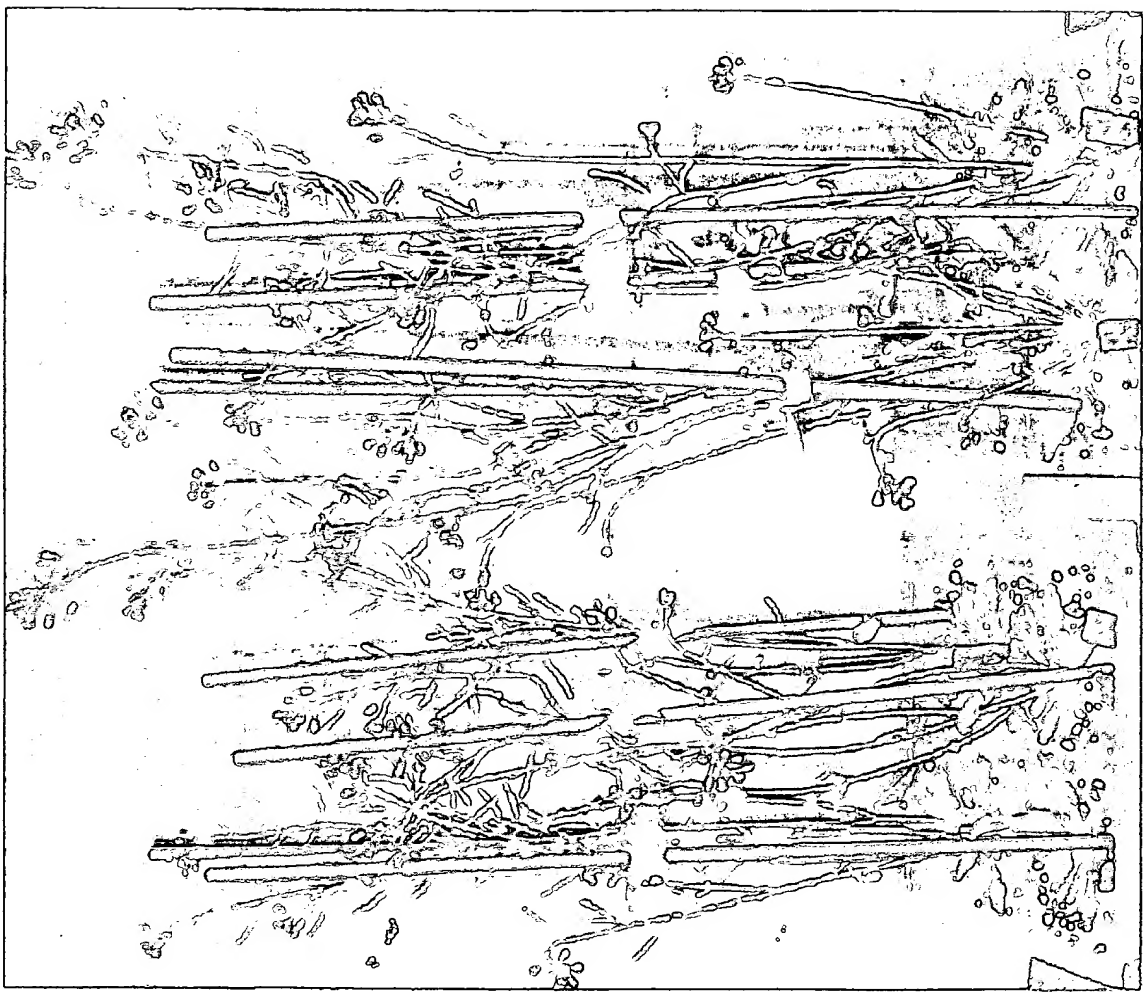


α-3'DHS #7

Wild-Type

FIG. 23

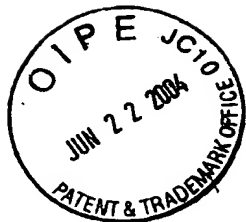
6.1 Weeks



$\alpha$ -3'DHS #7

Wild-Type

FIG. 24



27/42

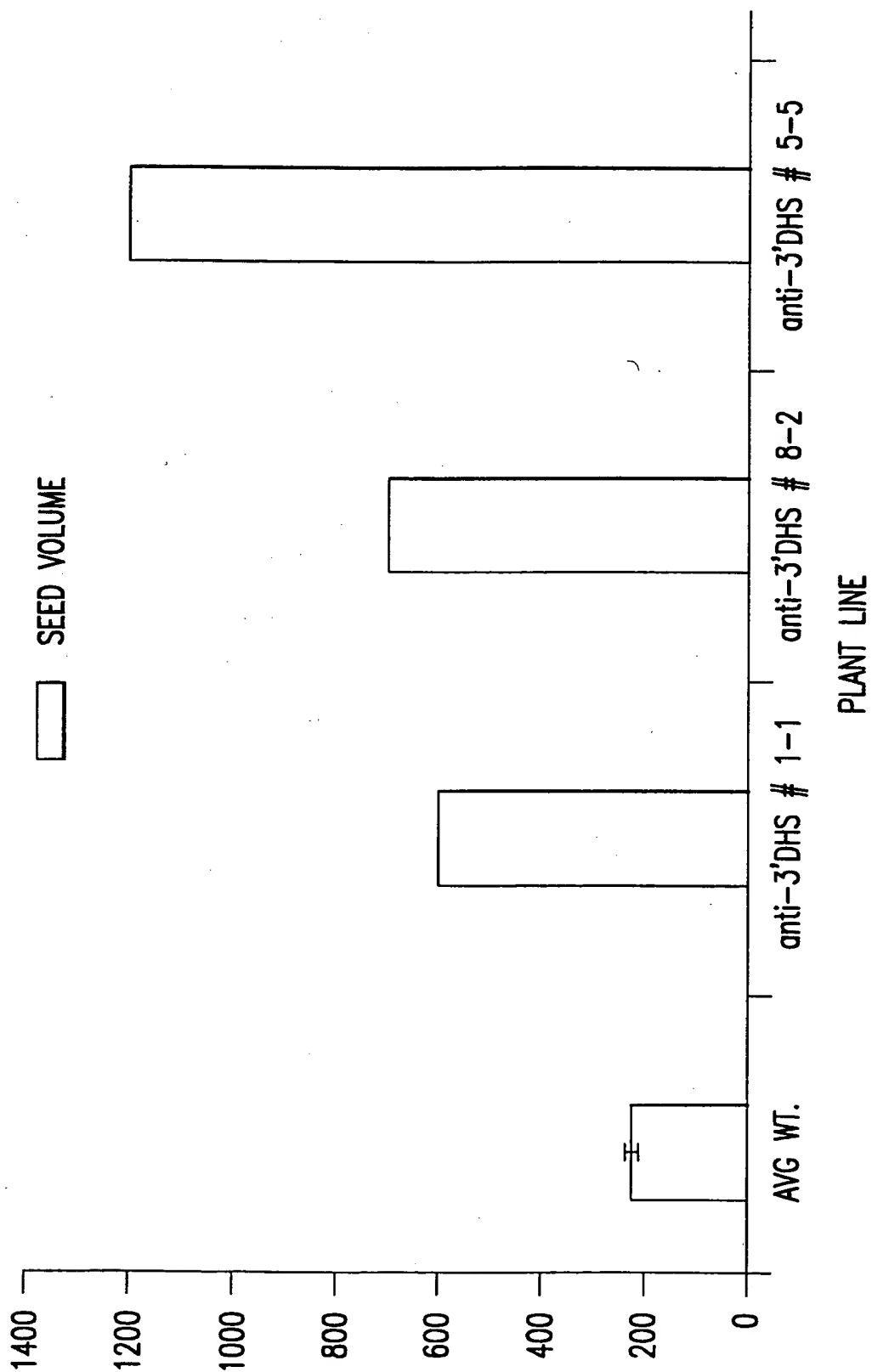
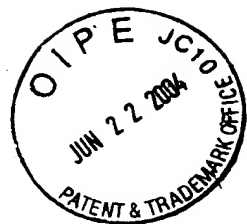


FIG.25



28/42



FIG.26

Wild type

Anti 3'-DHS

32 Days

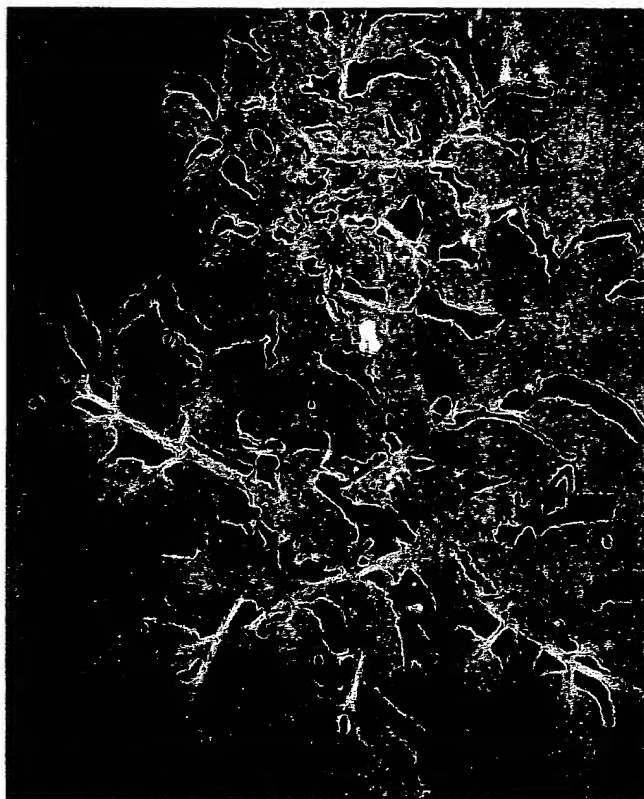


FIG.27



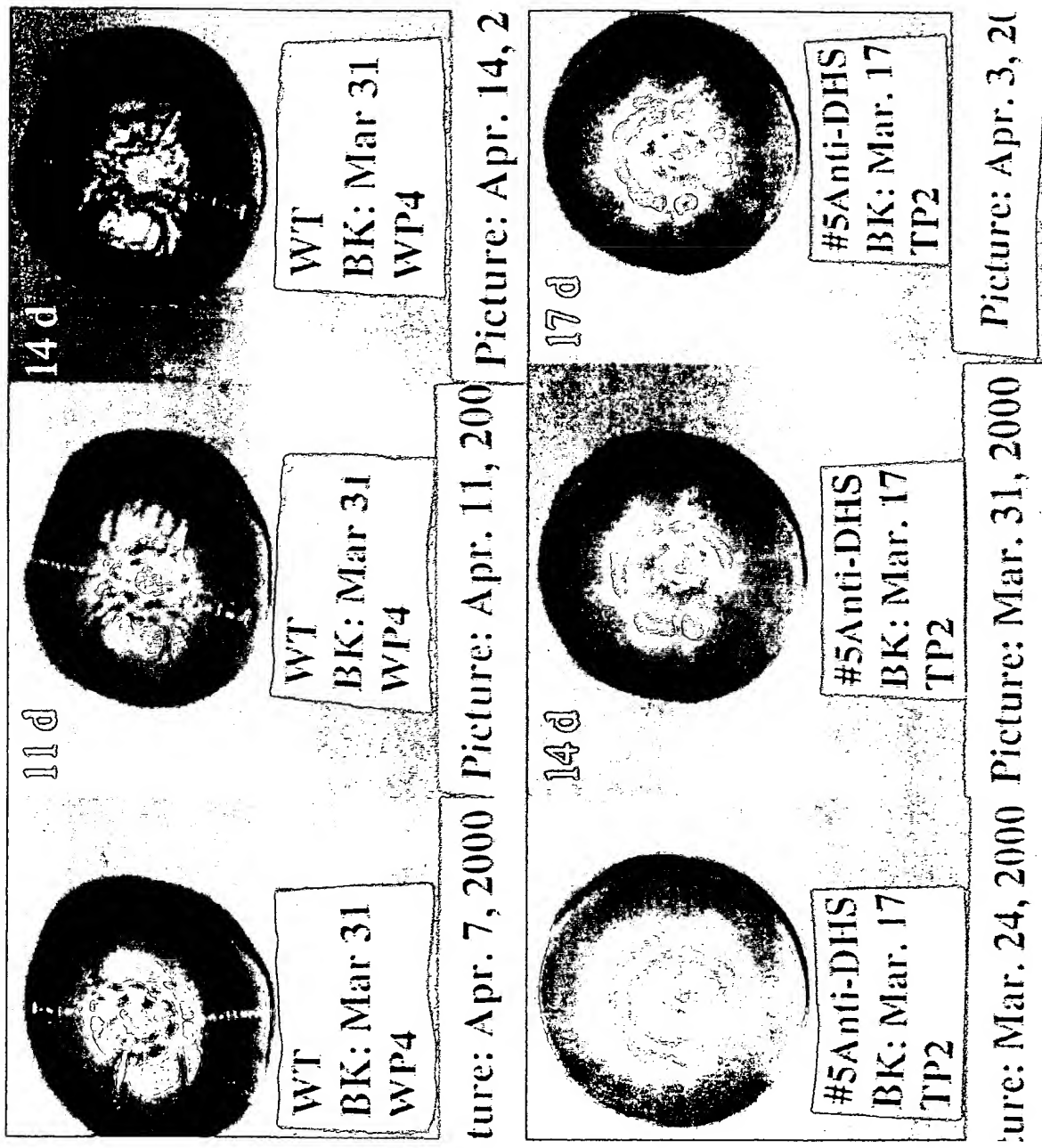


FIG.29



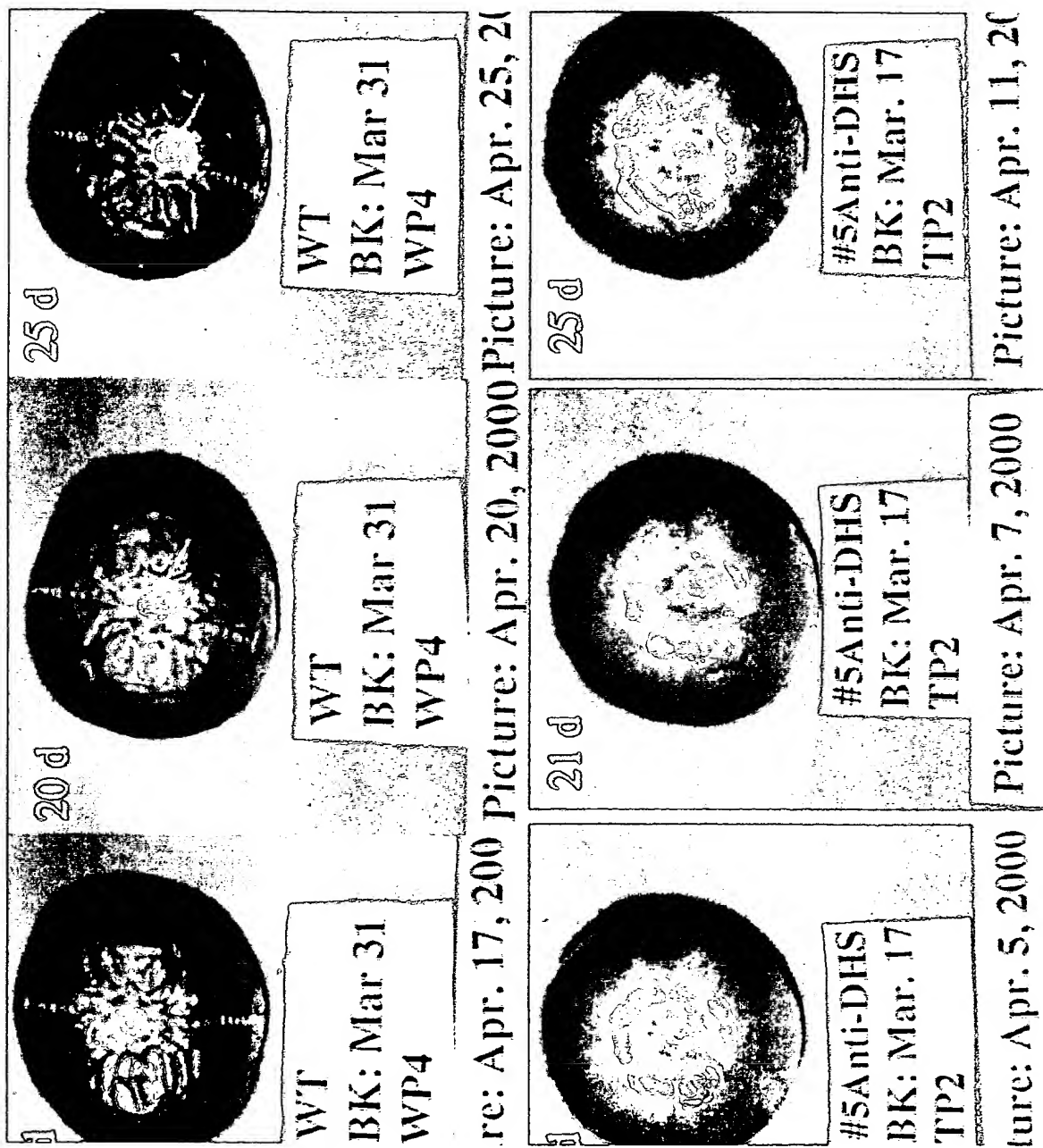


FIG. 30

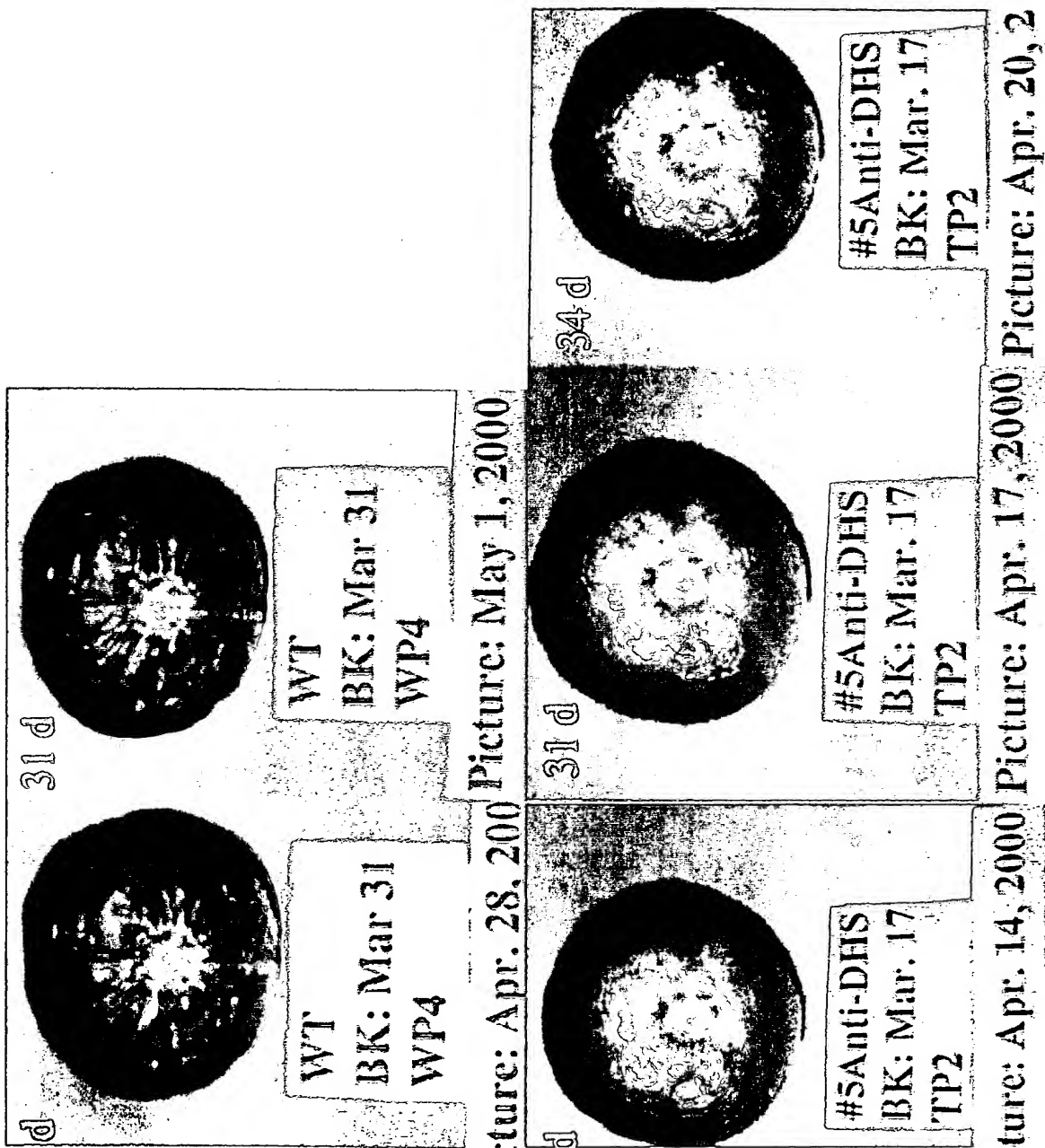


FIG.31

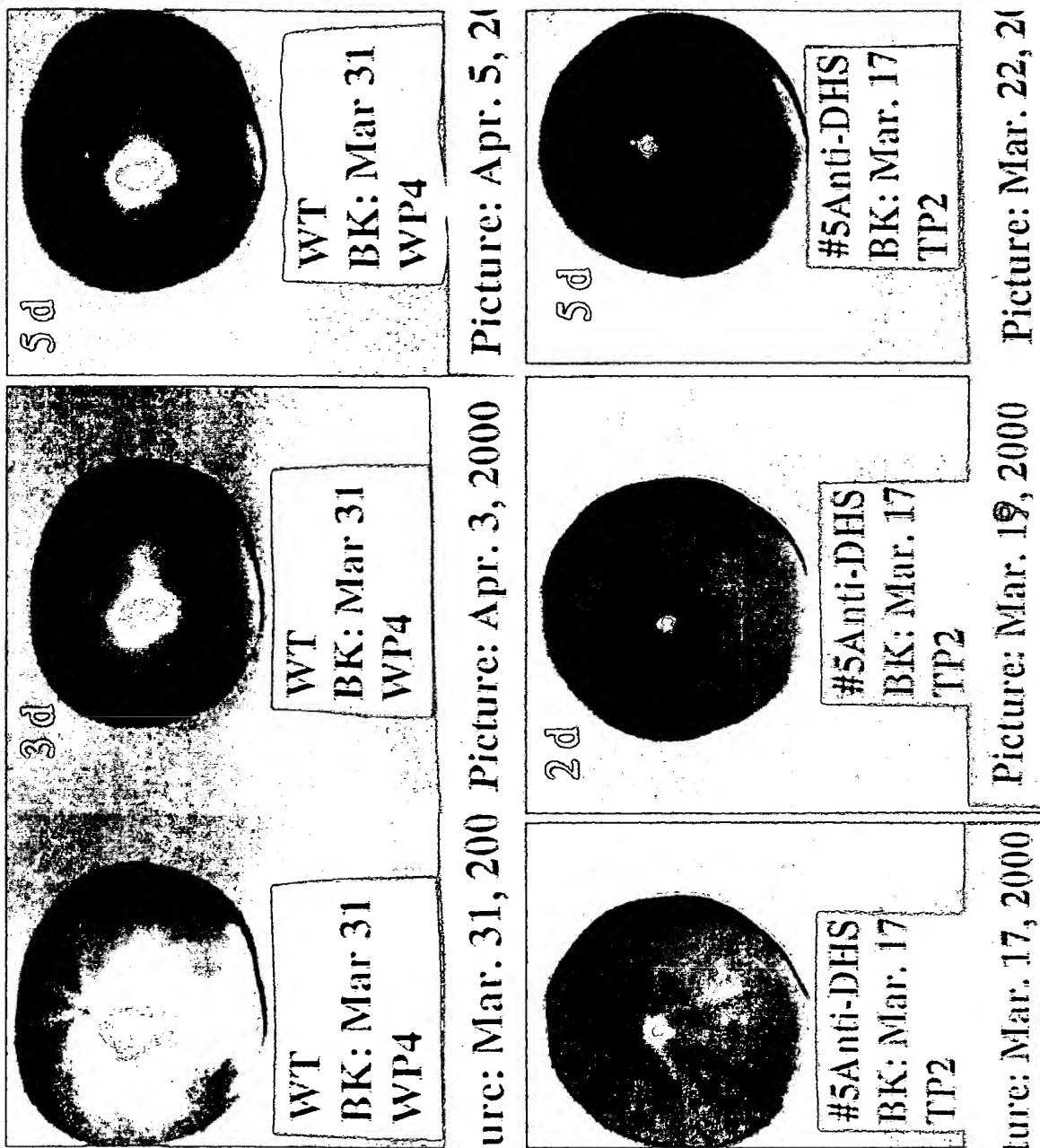


FIG.32

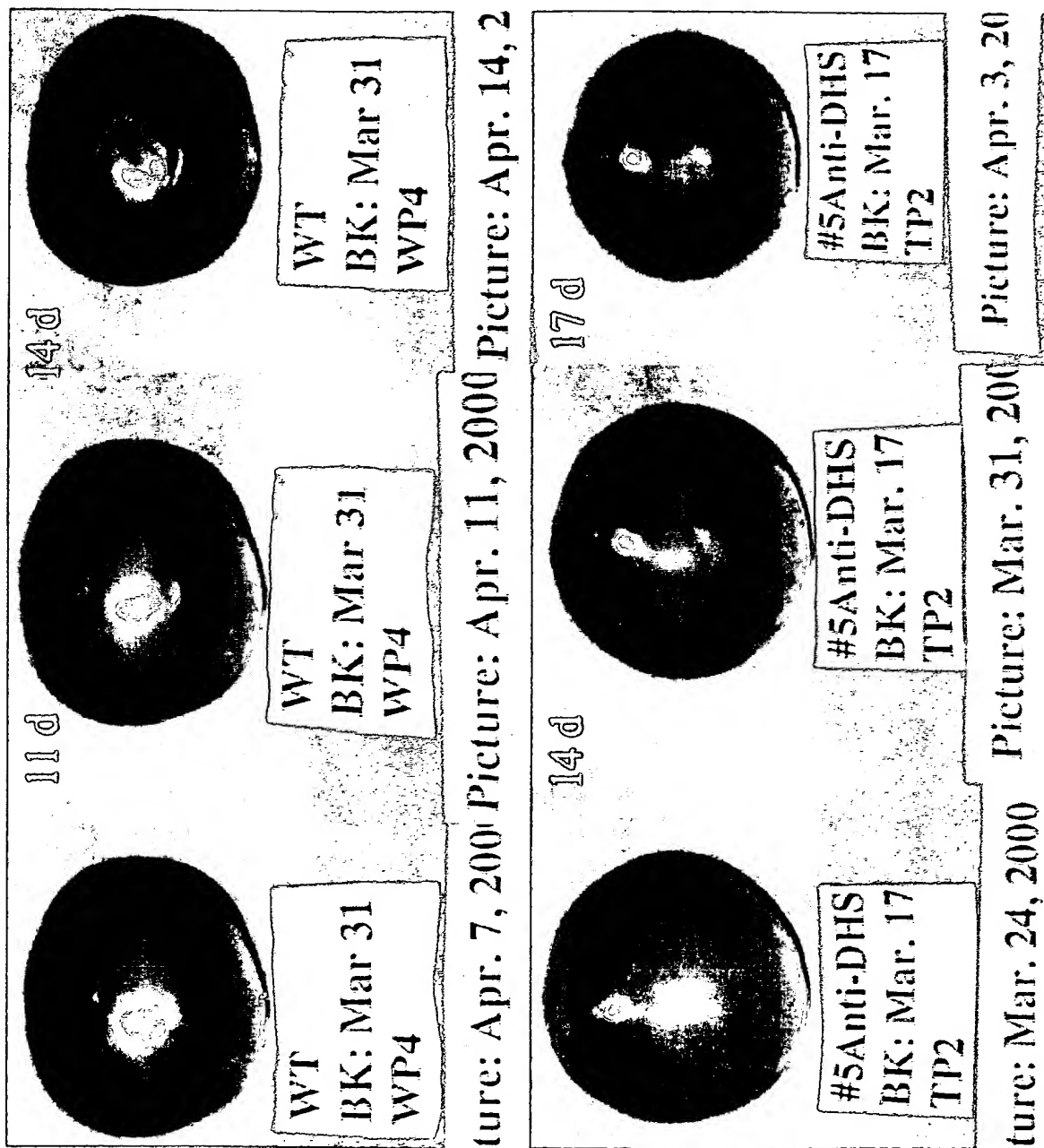


FIG.33

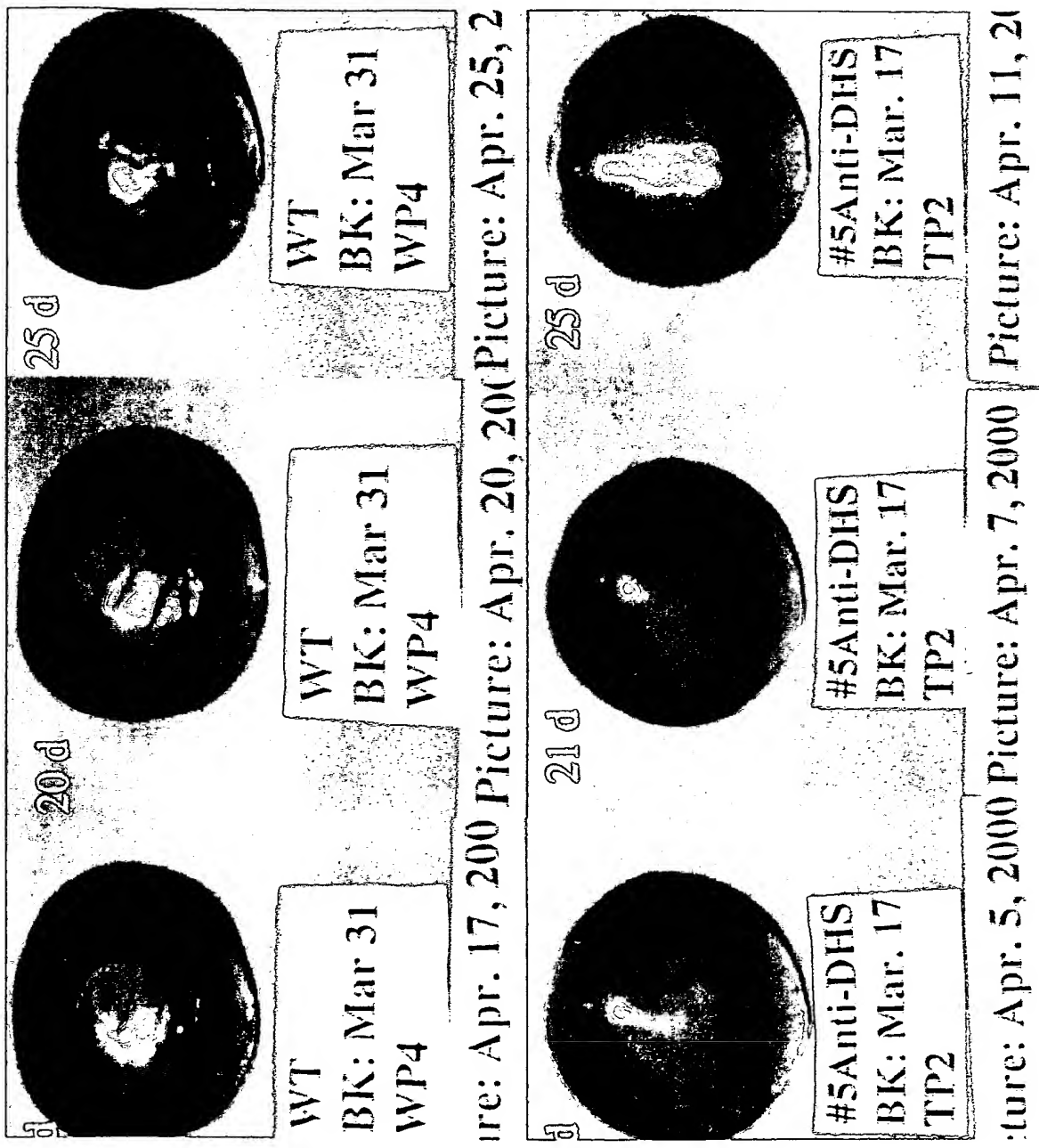


FIG.34

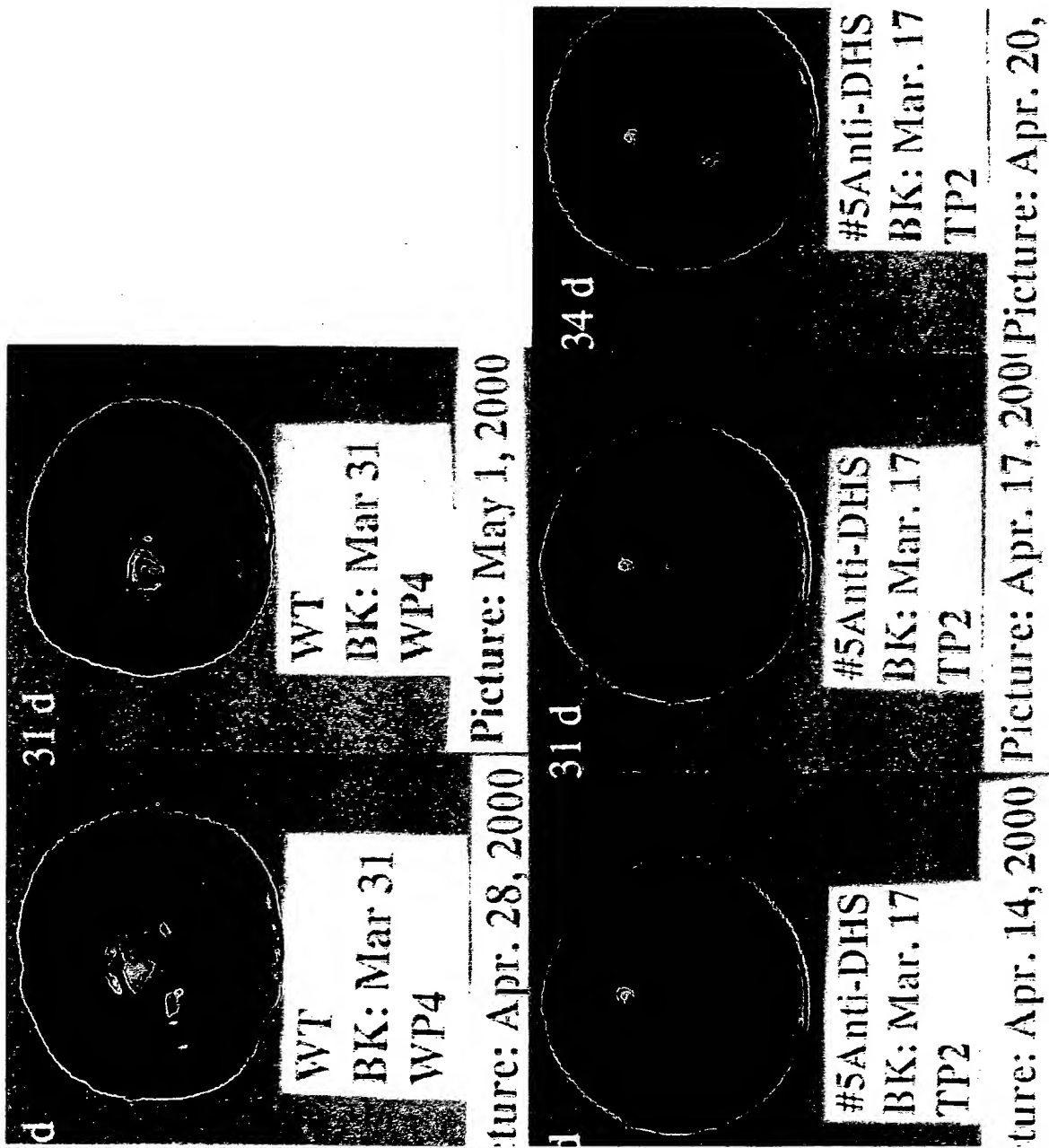
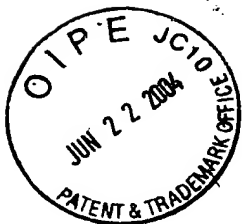


FIG.35



38/42

Arabidopsis 3'-end DHS for antisense

Nucleotide and derived amino acid sequence

TGCACGCCCTGATGAAGCTGTGTCTTGGGGTAAAATTAGGGGTTCTGCTAAAACCGTTAAGGTCTGCTTTT  
A R P D E A V S W G K I R G S A K T V K V C F

TAATTTCTTCACATCCTAATTTATATCTCACTCAGTGGTTTTGAGTACATATTTAATATTGGATCATTCTT  
L I S S H P N L Y L T Q W F

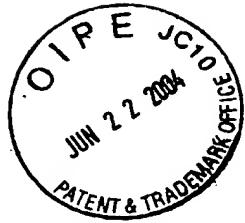
GCAGGTATACTGTGATGCTACCATAGCCTTCCCATTGTTGGTTGCAGAAACATTTGCCACAAAGAGAGACC  
AAACCTGTGAGTCTAAGACTTAAGAACTGACTGGTCGTTTTGGCCATGGATTCTTAAAGATCGTTGCTTTT  
TGATTTTACACTGGAGTGACCATATAACACTCCACATTGATGTGGCTGTGACGCGAATTGTCTTCTTGCGA  
ATTGTACTTTAGTTTCTCTCAACCTAAAATGATTTGCAGATTGTGTTTTCGTTTAAAACACAAGAGTCTTG  
TAGTCAATAATCCTTTGCCTTATAAAATTATTCAGTTCCAACAAAAAAAAAAAAAAAAAAAA

-----  
Nucleotide sequence

TGCACGCCCTGATGAAGCTGTGTCTTGGGGTAAAATTAGGGGTTCTGCTAAAACCGTTAAGGTCTGCTTTT  
TAATTTCTTCACATCCTAATTTATATCTCACTCAGTGGTTTTGAGTACATATTTAATATTGGATCATTCTT  
GCAGGTATACTGTGATGCTACCATAGCCTTCCCATTGTTGGTTGCAGAAACATTTGCCACAAAGAGAGACC  
AAACCTGTGAGTCTAAGACTTAAGAACTGACTGGTCGTTTTGGCCATGGATTCTTAAAGATCGTTGCTTTT  
TGATTTTACACTGGAGTGACCATATAACACTCCACATTGATGTGGCTGTGACGCGAATTGTCTTCTTGCGA  
ATTGTACTTTAGTTTCTCTCAACCTAAAATGATTTGCAGATTGTGTTTTCGTTTAAAACACAAGAGTCTTG  
TAGTCAATAATCCTTTGCCTTATAAAATTATTCAGTTCCAACAAAAAAAAAAAAAAAAAAAA

ARPDEAVSWGKIRGSAKTVKVCFLISSHPNLYLTQWF

FIG.36



Tomato 3'-end-Deoxyhupsine synthase used for antisense

Nucleotide and derived amino acid sequence

GGTGCTCGTCTGATGAAGCTGTATCATGGGAAAGATACGTGGTGCCCAAGACTGTGAAGGTGCATTGTGATGCAAC  
G A R P D E A V S W G K I R G G A K T V K V H C D A T

CATTGCATTTCCCATATTAGTAGCTGAGACATTTGCAGCTAAGAGTAAGGAATTCTCCAGATAAGGTGCCAAGTTTGAA  
I A F P I L V A E T F A A K S K E F S Q I R C Q V

CATTGAGGAAGCTGTCTCCGACCACACATATGAATTGCTAGCTTTTGAAGCCAACTTGCTAGTGTGCAGCACCATTTA  
TTCTGCAAAACTGACTAGAGAGCAGGTATATTCCTCTACCCCGAGTTAGACGACATCCTGTATGGTTCAAATTAATTAT  
TTTTCTCCCTTCACACCATGTTATTAGTCTCTCTCTCGAAAGTGAAGAGCTTAGATGTTTCATAGGTTTTGAATT  
ATGTTGGAGGTTGGTGATAACTGACTAGTCCTCTTACCATATAGATAATGTATCCTTGCTACTATGAGATTTTGGGTGTGT  
TTGATACCAAGGAAAAATGTTTATTTGGAAACAATTGGATTTTAAATTTAAAAAAATTGNTTAAAAAAATAAAAAA

-----

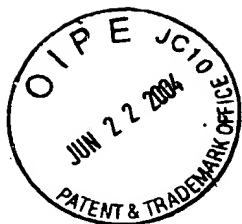
Nucleotide sequence

GGTGCTCGTCTGATGAAGCTGTATCATGGGAAAGATACGTGGTGCCCAAGACTGTGAAGGTGCATTGTGATGCAAC  
CATTGCATTTCCCATATTAGTAGCTGAGACATTTGCAGCTAAGAGTAAGGAATTC

TCCCAGATAAGGTGCCAAGTTTGAACATTGAGGAAGCTGTCTCCGACCACACATATGAATTGCTAGCTTTTGAAGCCA  
ACTTGCTAGTGTGCAGCACCATTTATCTGCAAAACTGACTAGAGAGCAGGTATATTCCTCTACCCCGAGTTAGACGAC  
ATCCTGTATGGTTCAAATTAATTTTCTCCCTTCACACCATGTTATTAGTCTCTCTCCTCTTCGAAAGTGAAGAG  
CTTAGATGTTTCATAGGTTTGAATTATGTTGGAGGTTGGTGATAACTGACTAGTCTCTTACCATATAGATAATGTATCC  
TTGCTACTATGAGATTTTGGGTGTGTTTGATACCAAGGAAAAATGTTTATTTGGAAACAATTGGATTTTAAATTTAAAAA  
AAATTGNTTAAAAAAATAAAAAA

FIG.37





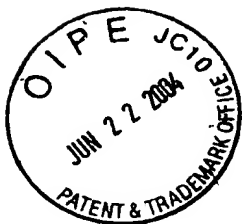
40/42

600 bp Arabidopsis Deoxyhypusine Synthase Probe

Primer1 (underlined)

GGTGGTGTTGAGGAAGATCTCATAAAATGCCTTGCACCTACATTTAAAGGTGATTTCTCTCTACCTGGAGC  
TTATTTAAG  
G G V E E D L I K C L A P T F K G D F S L P G A  
Y L R  
GTCAAAGGGATTGAACCGAATTGGGAATTTGCTGGTTCCTAATGATAACTACTGCAAGTTTGAGGATTGGA  
TCATTCCCA  
S K G L N R I G N L L V P N D N Y C K F E D W I  
I P  
TCTTTGACGAGATGTTGAAGGAACAGAAAGAAGAGAATGTGTTGTGGACTCCTTCTAAACTGTTAGCACGG  
CTGGGAAAA  
I F D E M L K E Q K E E N V L W T P S K L L A R  
L G K  
GAAATCAACAATGAGAGTTCATACCTTTATTGGGCATACAAGATGAATATTCCAGTATTCTGCCCAGGGTT  
AACAGATGG  
E I N N E S S Y L Y W A Y K M N I P V F C F G L  
T D G  
CTCTCTTAGGGATATGCTGTATTTTCACTCTTTTCGTACCTCTGGCCTCATCATCGATGTAGTACAAGATA  
TCAGAGCTA  
  
S L R D M L Y F H S F R T S G L I I D V V Q D I  
R A  
TGAACGGCGAAGCTGTCCATGCAAATCCTAAAAAGACAGGGATGATAATCCTTGGAGGGGGCTTGCCAAAG  
CACCACATA  
M N G E A V H A N P K K T G M I I L G G G L P K  
H H I  
TGTAATGCCAATATGATGCGCAATGGTGCAGATTACGCTGTATTTATAAACACCGGGCAAGAATTTGATGG  
GAGCGACTC  
C N A N M M R N G A D Y A V F I N T G Q E F D G  
S D S  
GGGTGCACGCCCTGATGAAGC  
G A R P D E  
Primer 2 (underlined)

FIG.38



41/42

483 bp Carnation Deoxyhypusine Synthase Probe

GAAGATCCATCAAGTGCCTTGCACCCACTTTCAAAGGCGATTTTGCCTTACCAGGAGCTCAATTACGCTCC  
AAAGGGT  
R R S I K C L A P T F K G D F A L P G A Q L R S  
K G

TGAATCGAATTGGTAATCTGTTGGTTCCGAATGATACTACTGTAAATTTGAGGATTGGATCATTCCAATT  
TTAGATA  
L N R I G N L L V P N D N Y C K F E D W I I P I  
L D

AGATGTTGGAAGAGCAAATTTTCAGAGAAAATCTTATGGACACCATCGAAGTTGATTGGTCGATTAGGAAGA  
GAAATAA  
K M L E E Q I S E K I L W T P S K L I G R L G R  
E I

ACGATGAGAGTTCATACCTTTACTGGGCCTTCAAGAACAATATTCCAGTATTTTGCCCAGGTTTAACAGAC  
GGCTCAC  
N D E S S Y L Y W A F K N N I P V F C P G L T D  
G S

TCGGAGACATGCTATATTTTCATTCTTTTCGCAATCCGGGTTTAATCATCGATGTTGTGCAAGATATAAGA  
GCAGTAA  
L G D M L Y F H S F R N P G L I I D V V Q D I R  
A V

ATGGCGAGGCTGTGCACGCAGCGCCTAGGAAAACAGGCATGATTATACTCGGTGGAGGGTTGCCTAAGCAC  
CACATCT  
N G E A V H A A P R K T G M I I L G G G L P K H  
H I

GCAACGCAAACATGATGAGAAATGGCGCCGATTATGCTGTTTTTCATCAACACCG  
C N A N M M R N G A D Y A V F I N T

A full-length cDNA clone was obtained by screening a carnation senescing petal cDNA library with this probe.

FIG.39

Blossom end rot

Normal

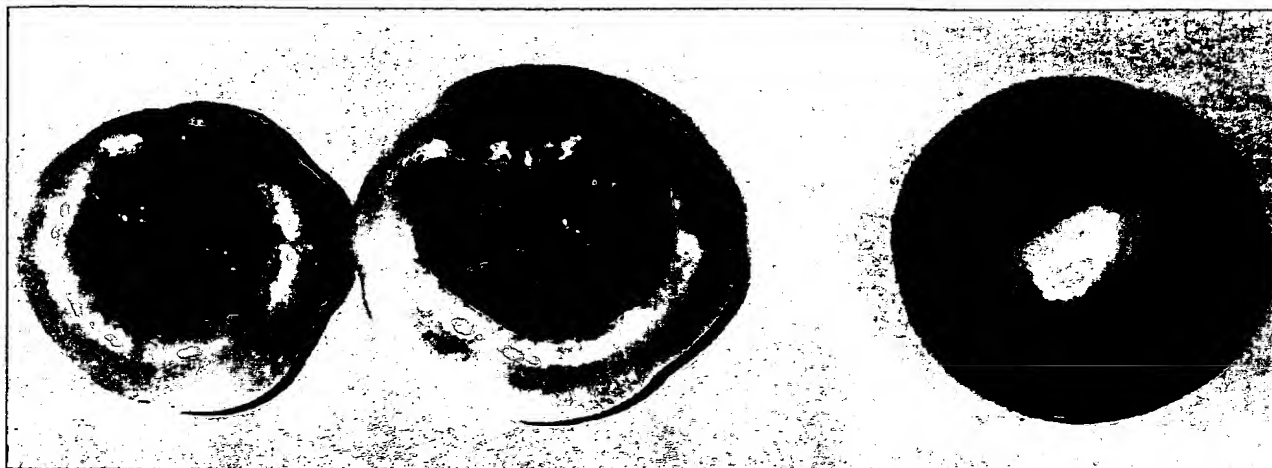


FIG.40A

Blossom end rot

Normal

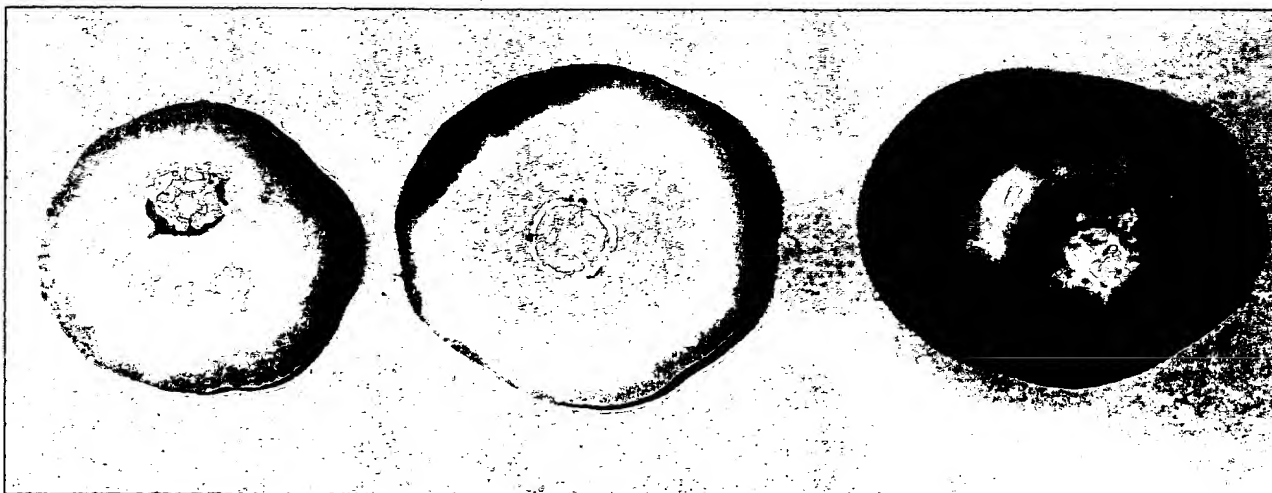


FIG.40B